Aerosol-UA satellite mission for polarimetric study of aerosols in the atmosphere: current status and prospects

Yaroslav S. Yatskiv[a], Oleksandr V. Degtyarev[b], Ivan I. Syniavskyi[a], Gennadii P. Milinevskyi[a,c,*], Mikhail G. Sosonkin[a], Vassyl O. Danylevsky[c], Yevgen A. Oberemok[c], Andrii P. Bovchaliuk[a], Janna M. Dlugach[a], Ihor V. Fesianov[c], and Yury S. Ivanov[a]

[a]*Main Astronomical Observatory of the National Academy of Sciences of Ukraine, 27 Zabolotny Str., 03680, Kyiv, Ukraine*
[b]*Yuzhnoye State Design Office, 3 Krivorizka Str., 49008, Dnipro, Ukraine*
[c]*Taras Shevchenko National University of Kyiv, 64/13 Volodymyrska Str., 01601, Kyiv, Ukraine*

[*]*Presenting author (genmilinevsky@gmail.com)*

The current status of the Ukrainian space project Aerosol-UA, which will provide the data on the terrestrial atmospheric aerosol spatial distribution and microphysics, is presented. The aerosol remote sensing concept is based on measurements by the multispectral Scanning Polarimeter (ScanPol) and the MultiSpectral Imaging Polarimeter (MSIP) on board the YuzhSat satellite platform [2]. ScanPol and MSIP polarimeters are designed to provide high precision measurements of the atmospheric/earth surface radiation polarization. The ScanPol allows measuring the three Stokes parameters *I*, *Q* and *U* of the sunlight, which is scattered by the atmospheric aerosols and the earth surface, from about 200 viewing along-track directions. The MSIP provides the aerosol parameters measurements and aerosol/clouds separation, which important for the ScanPol data corrections. These two Aerosol-UA instruments, combined together, allow carrying out multi-angular measurements of the polarized radiance with the considerable swath. Besides the onboard calibration function, the ScanPol allows the instruments cross-calibration procedure since the fields of view of two instruments are partly overlapped. The MSIP polarimeter spatial resolution is 6 km in nadir, which corresponds to the instantaneous field of view of the ScanPol polarimeter. The minimal number of phase angles of the single observation scene is about 15.

The polarimetric model for instrument calibration has been developed [2]. The advantages of the concept of the MSIP and ScanPol polarimeters cross-calibration are discussed. The prototype instruments ScanPol and MSIP units have already been manufactured assembled and the laboratory test equipment is designed and constructed. The stages of the mission development, plans and problems are considered in the talk.

References

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